

NAME:

DATE:

## Unit-2 Mastery Assessment (version 606)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[29] = 19$ , then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x}{6} + 23\right] + 37}{4}$$

Find the solution.

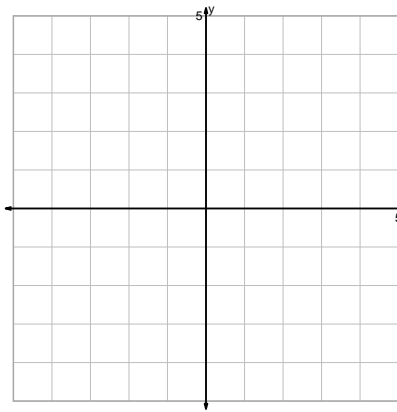
$$x =$$

$$y =$$

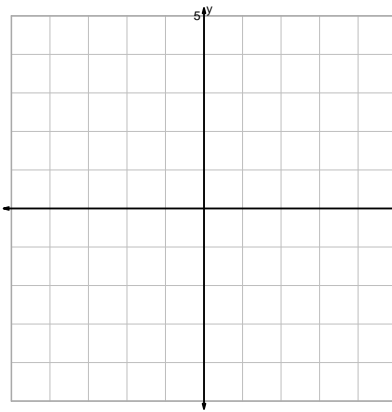
### Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

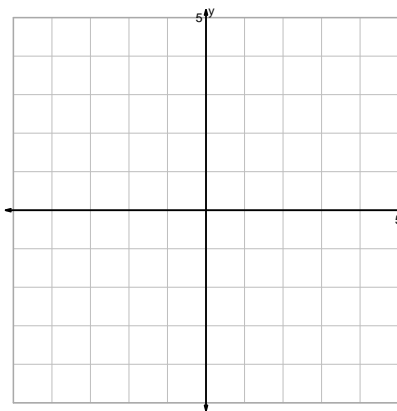
$$y = (2x)^3$$



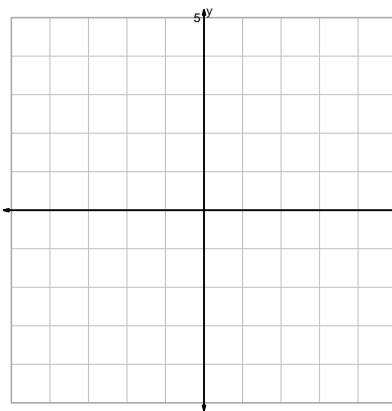
$$y = x^2 - 2$$



$$y = \frac{x^3}{2}$$

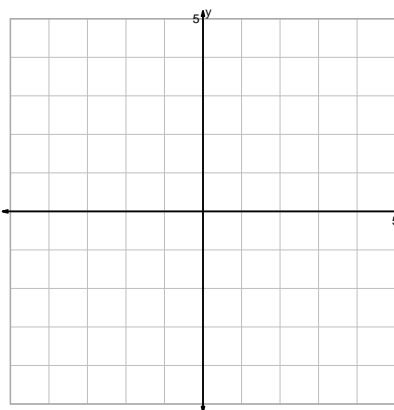


$$y = \sqrt[3]{x-2}$$

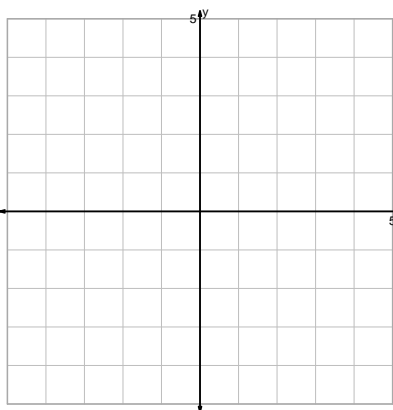


Question 2 continued...

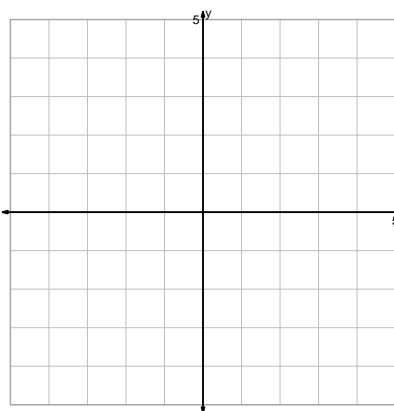
$$y = x^2 + 2$$



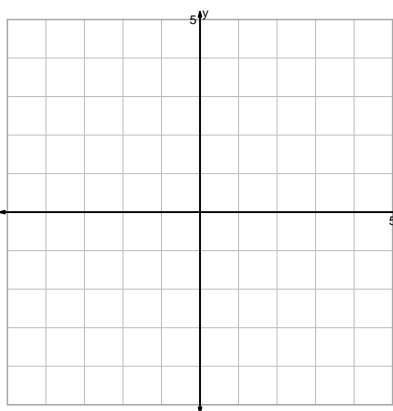
$$y = 2^{x+2}$$



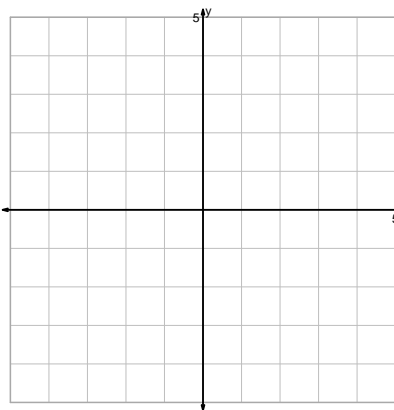
$$y = 2^{-x}$$



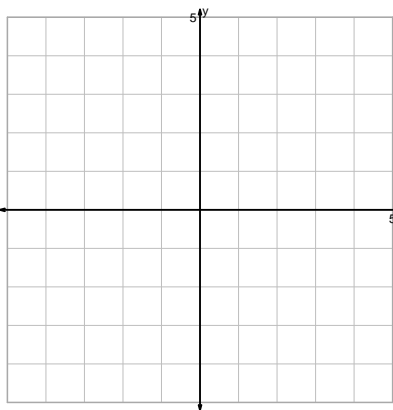
$$y = 2 \cdot \sqrt[3]{x}$$



$$y = \log_2\left(\frac{x}{2}\right)$$

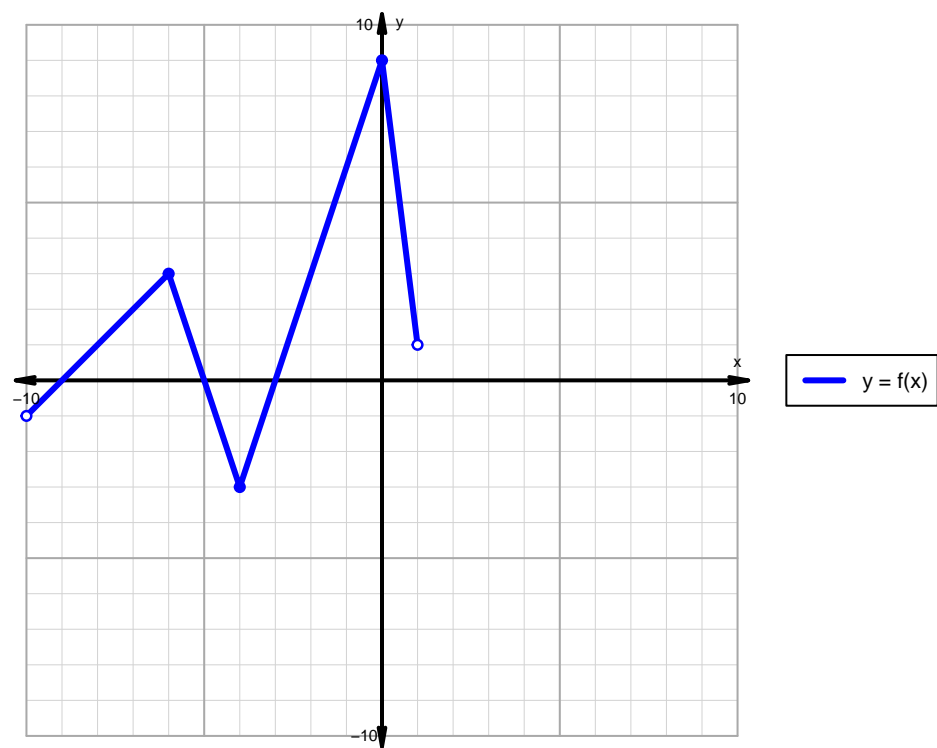


$$y = -\sqrt{x}$$



Question 3 (20 points)

A function is graphed below.



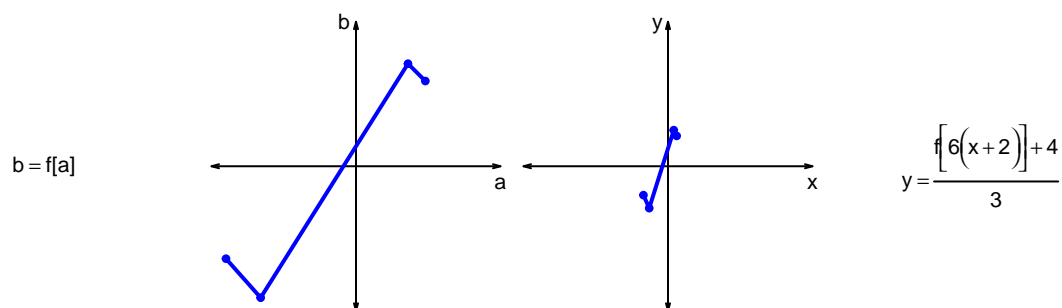
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

**Question 4 (20 points)**

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f[6(x+2)]+4}{3}$  are represented below in a table and on graphs.

a	b	x	y
-90	-64	-17	-20
-66	-91	-13	-29
36	71	4	25
48	59	6	21



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

- b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f[6(x+2)]+4}{3}$ ?

**Question 5 (10 points)**

A parent square-root function is transformed in the following ways:

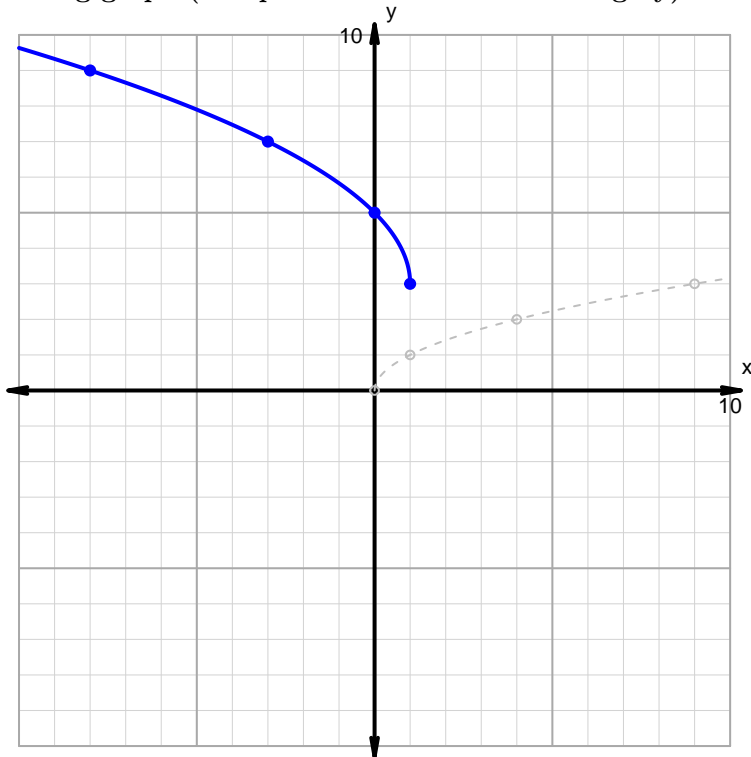
**Horizontal transformations**

1. Translate left by distance 1.
2. Horizontal reflection over  $y$  axis.

**Vertical transformations**

1. Vertical stretch by factor 2.
2. Translate up by distance 3.

**Resulting graph (and parent function in dashed grey):**

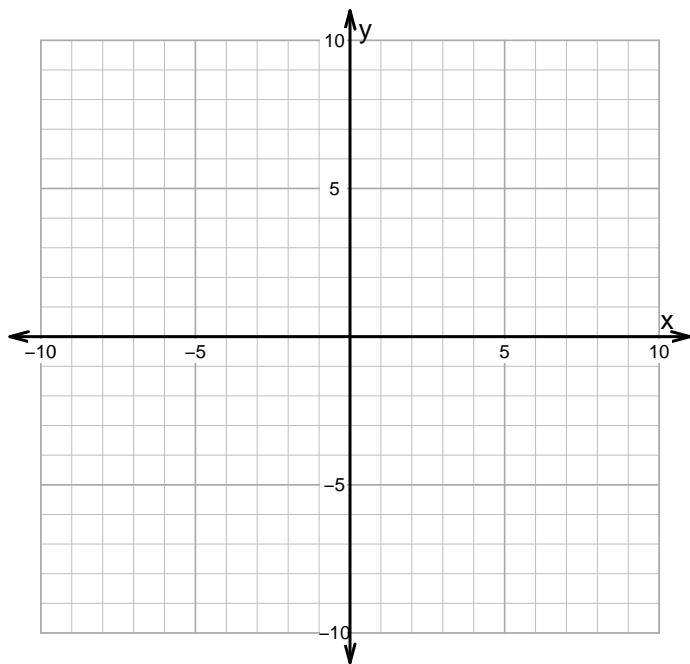


- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = 3 \cdot |x + 4| - 9$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	